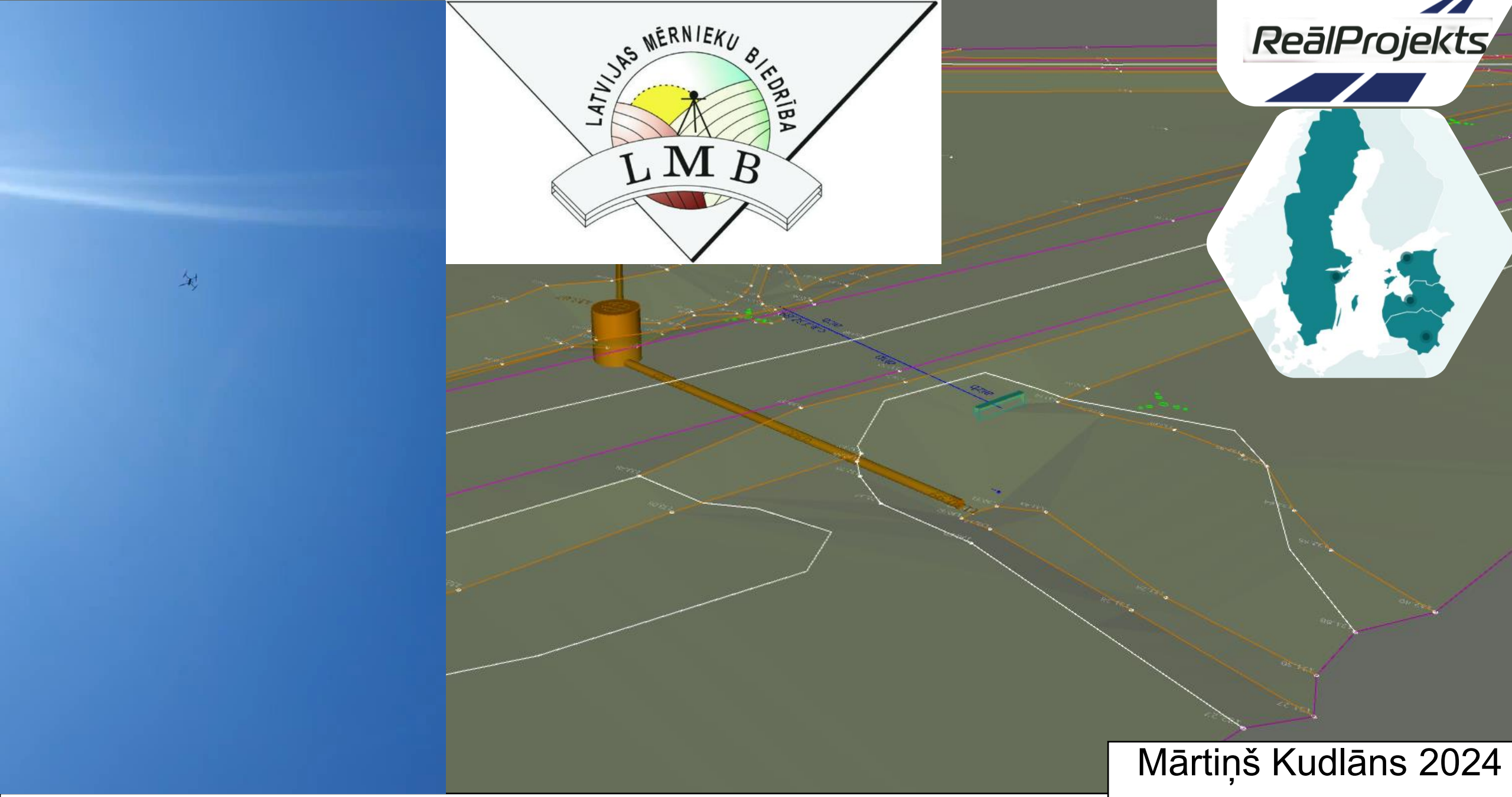
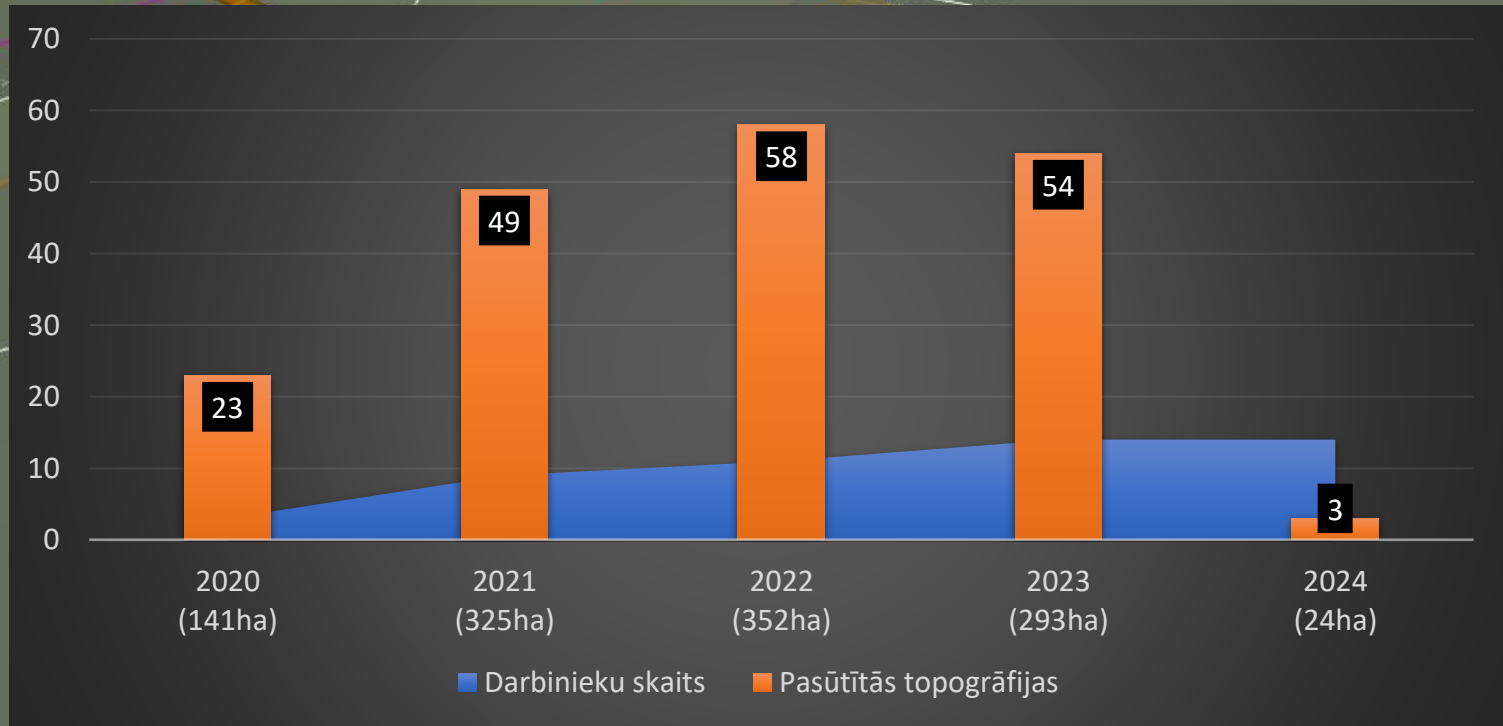


# 3D topogrāfija un virsmas punktu mākoņi

Mārtiņš Kudlāns 2024

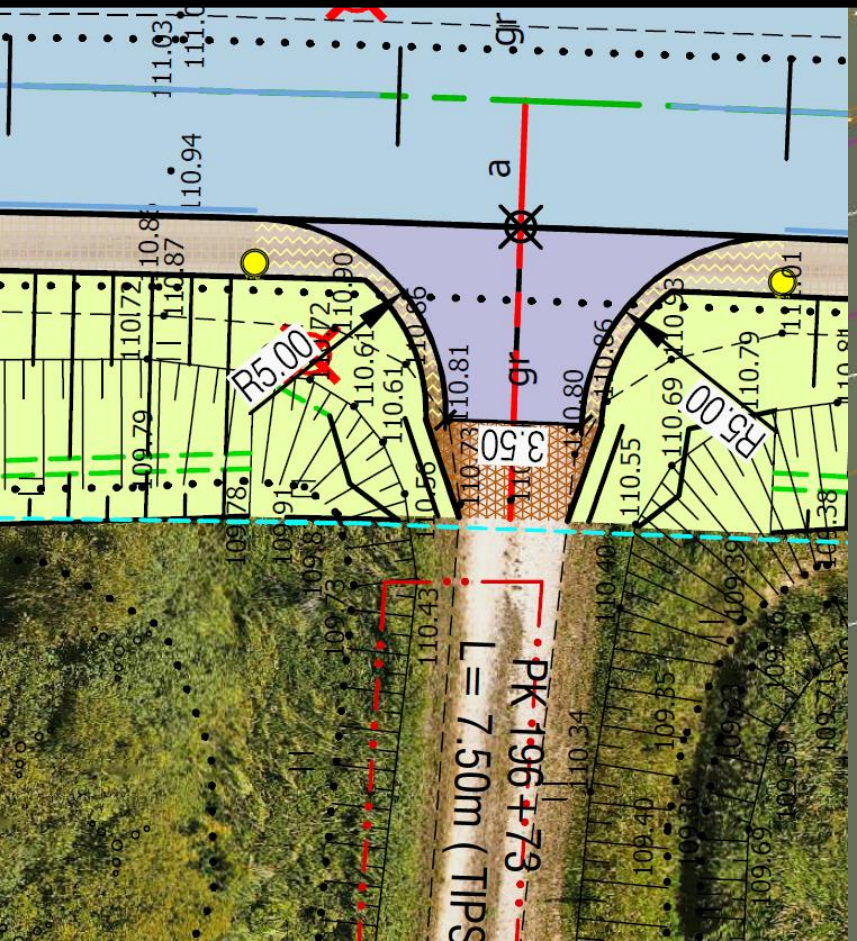
Transportbūvju inženieris
Projektu vadītājs

# Reālprojekts skaitļos:

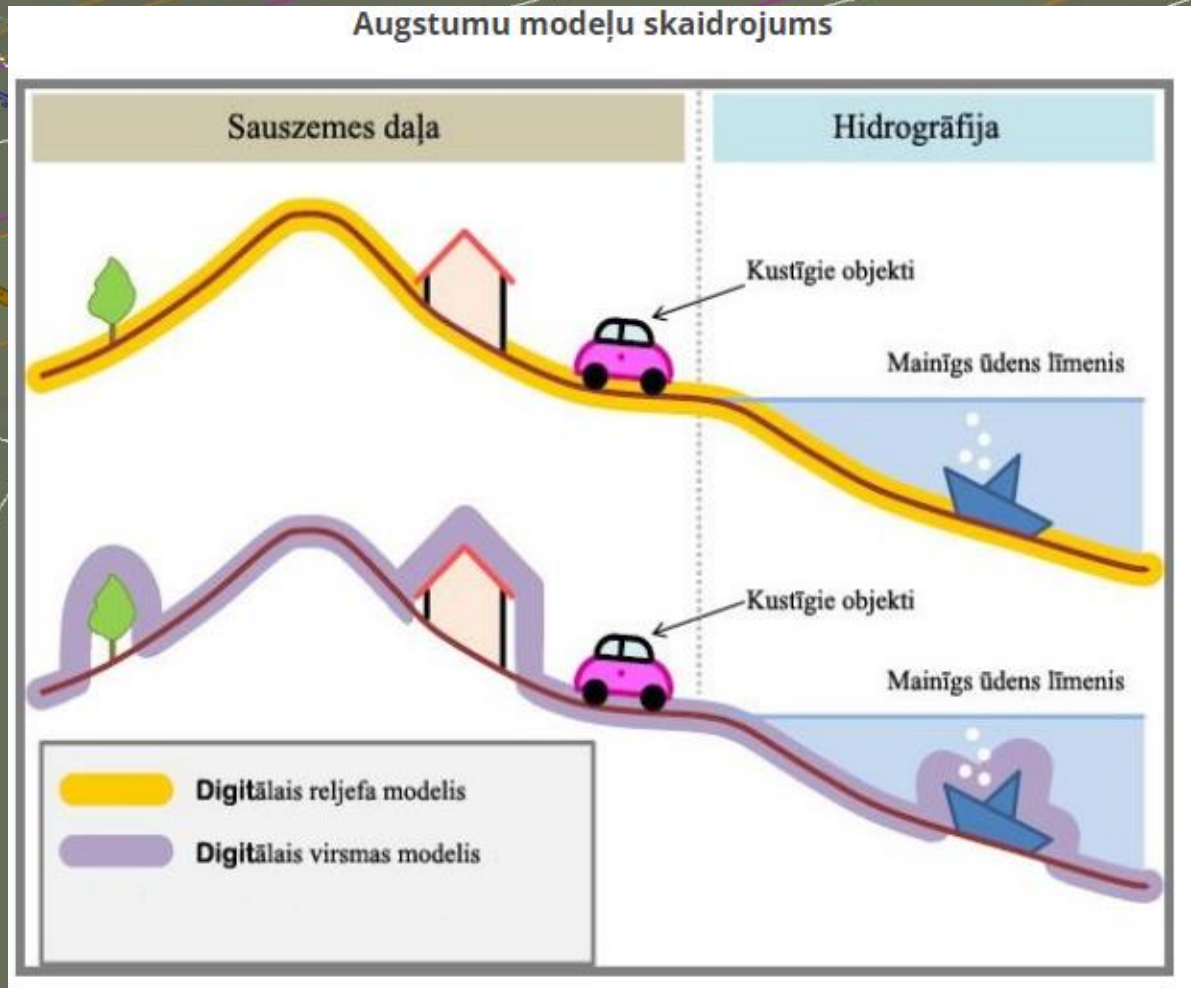


# Augstuma modeļi

Ortfoto kartes pielietojums: instrumentāli uzmērot punktu daudzums nav tik biežs, lai brauktuves pārejas posmus pielauztu pie esošās situācijas.

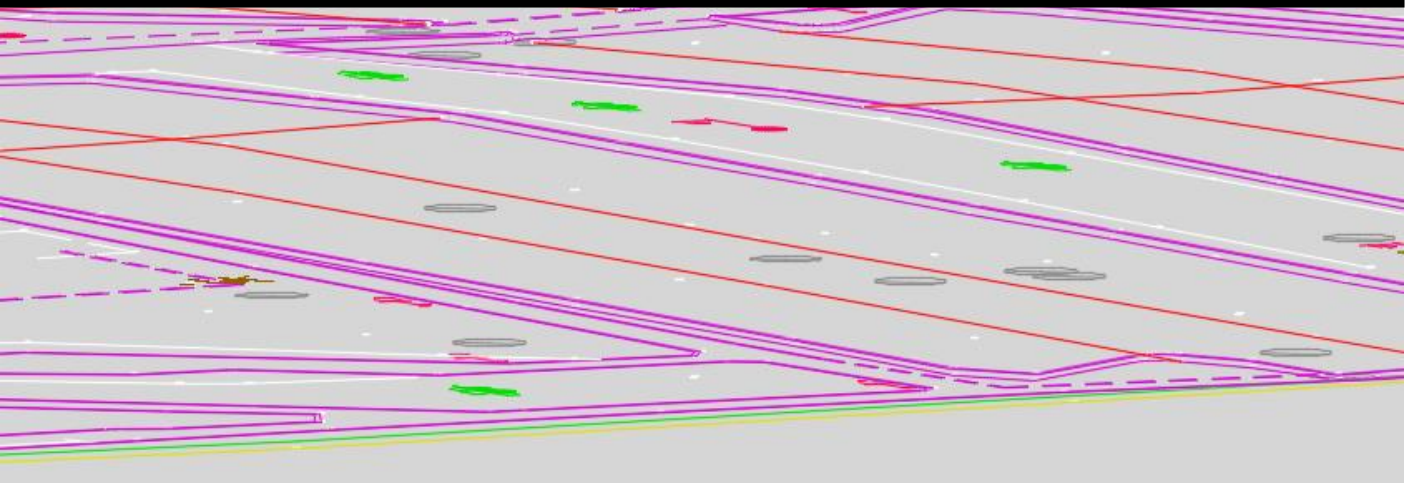



3D topogrāfija
Punktu mākonis
Ortfoto karte

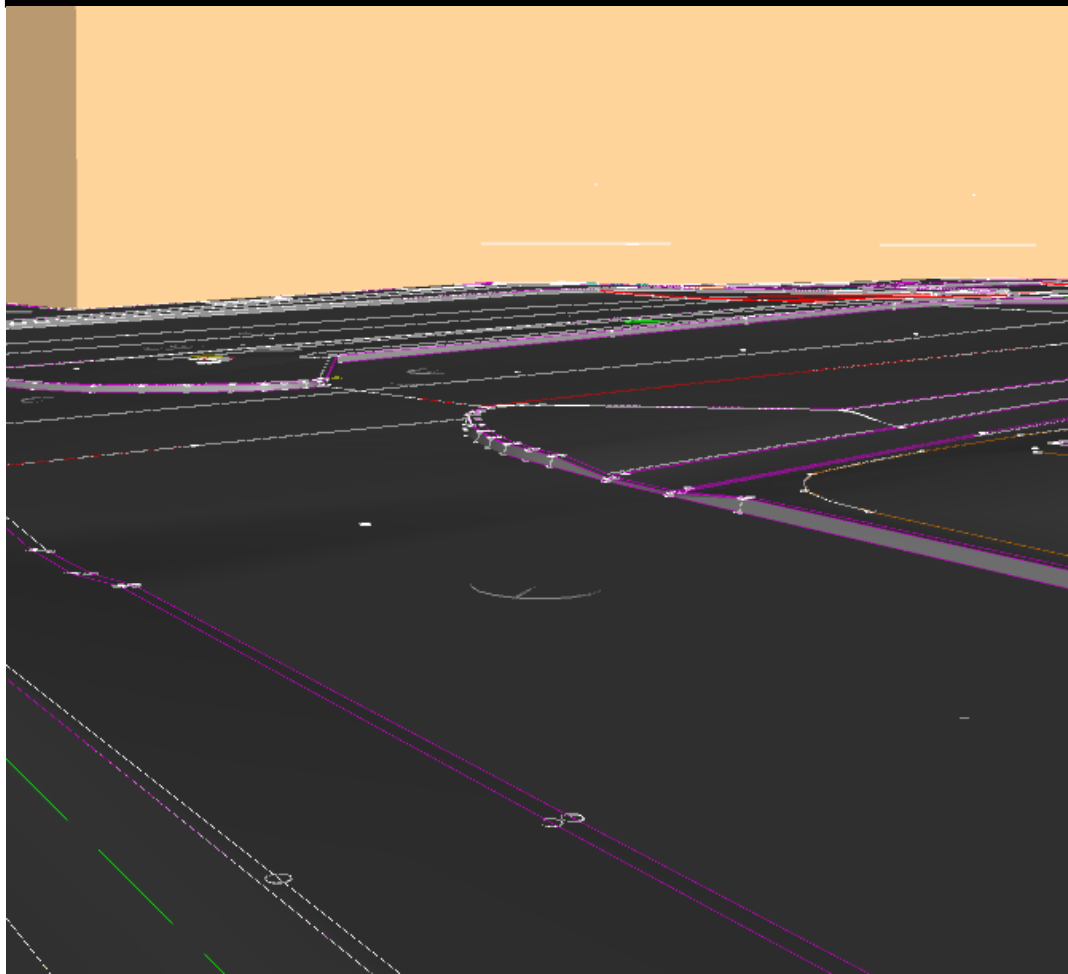


Parasta instrumentāli uzmērīta topogrāfija virsskatā

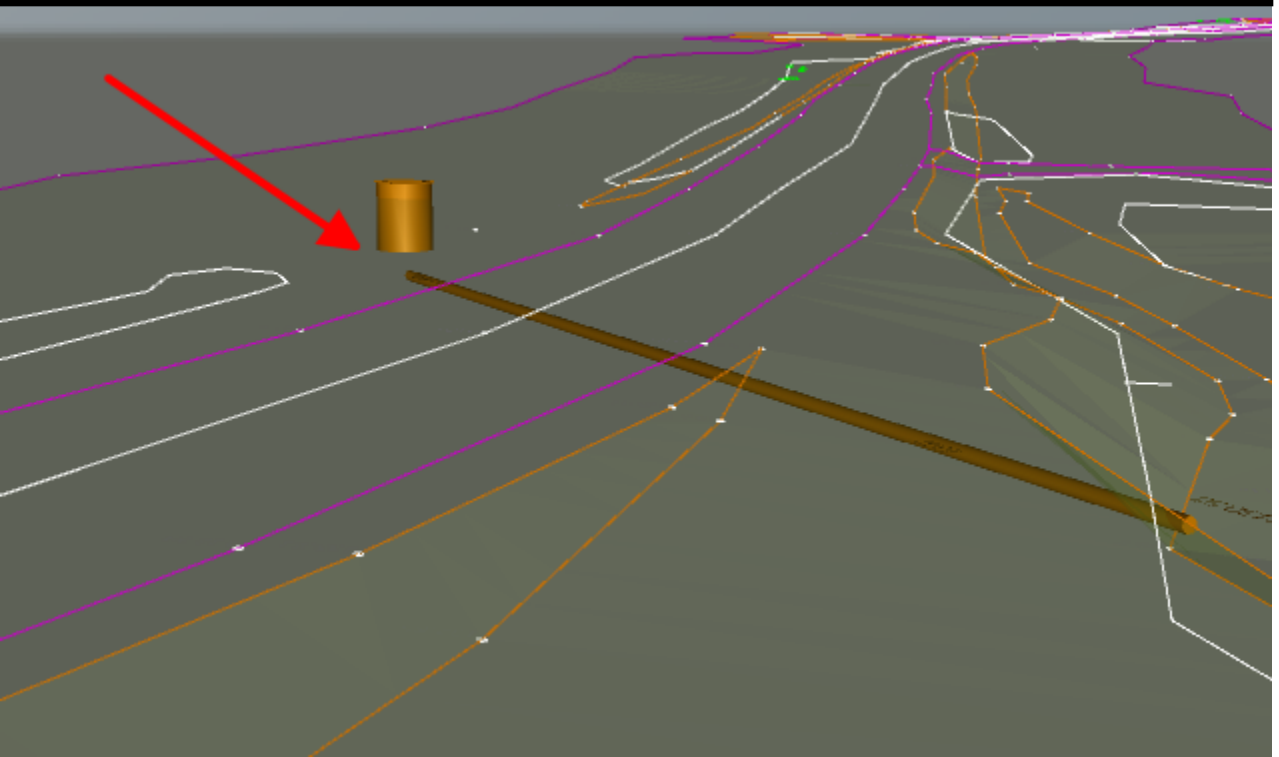

Parasta instrumentāli uzmērīta  topogrāfija ar 3d līnijām.



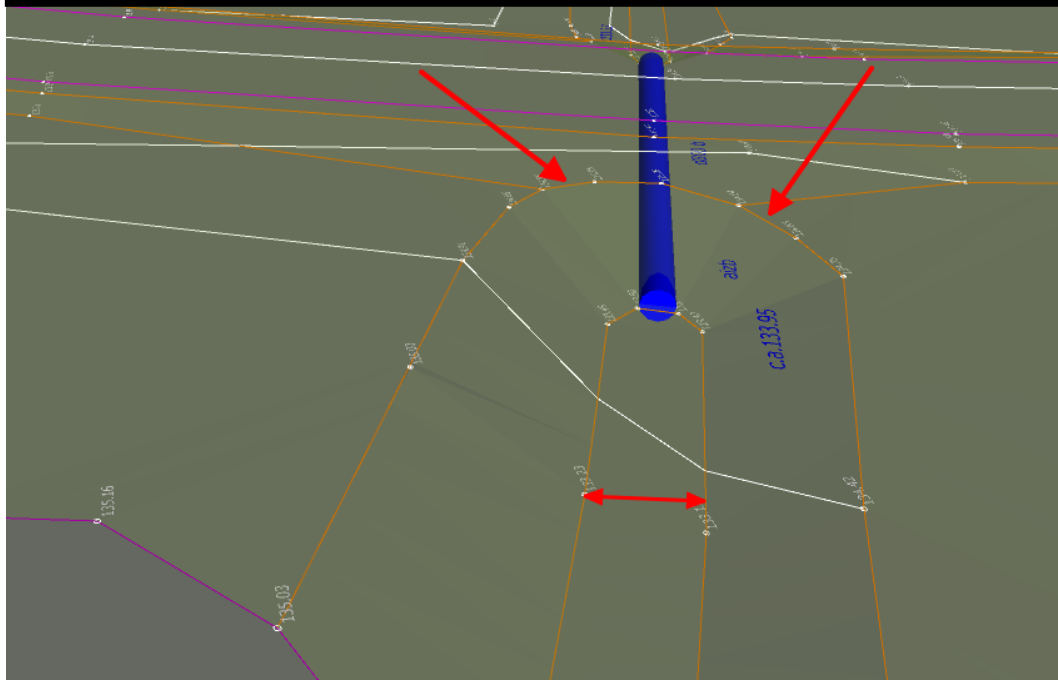
Tā pati topogrāfija vizuāli uzveramāka.



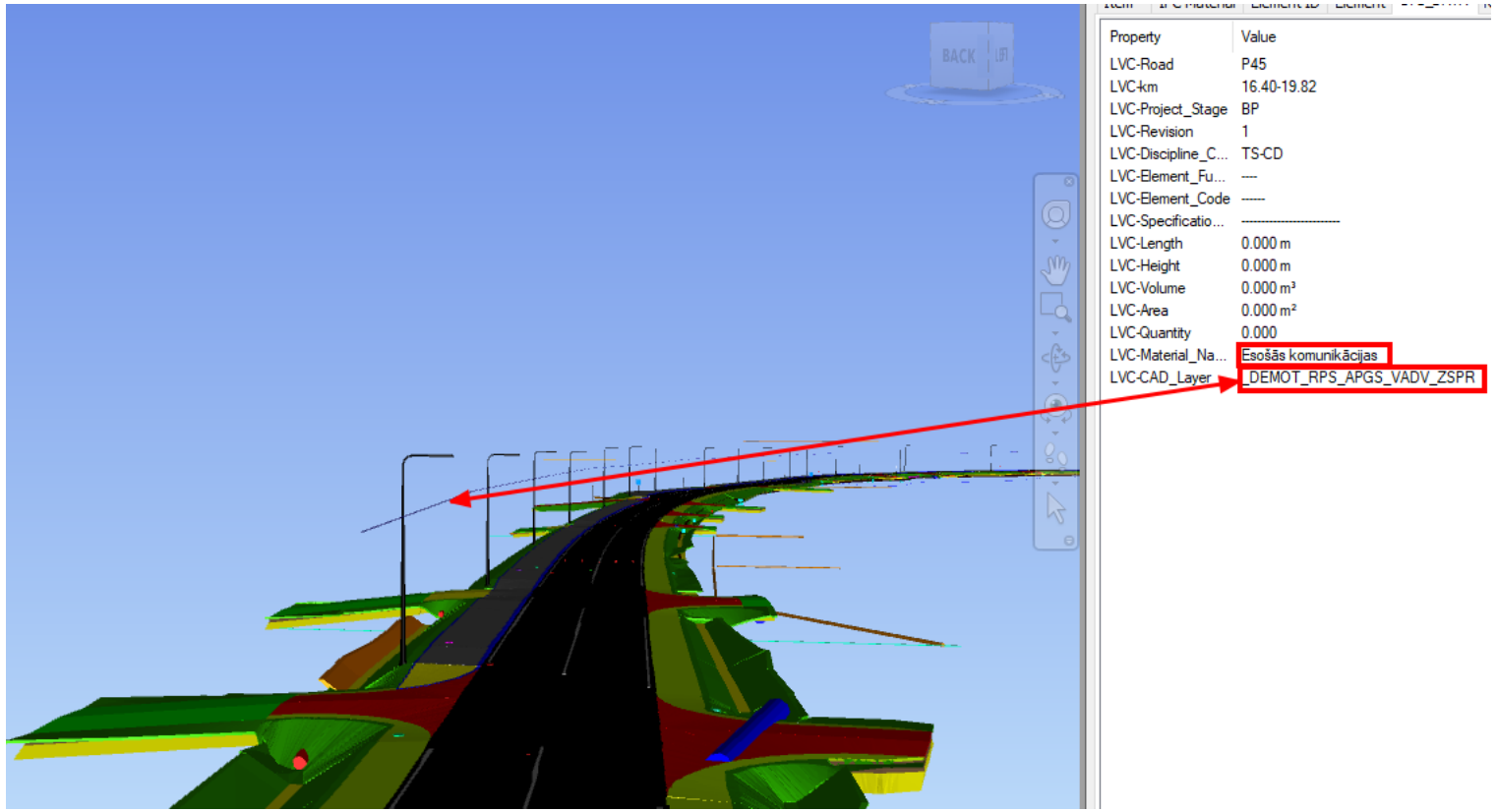
## Vieglāka kļūdu izķeršana uzmērījumā.



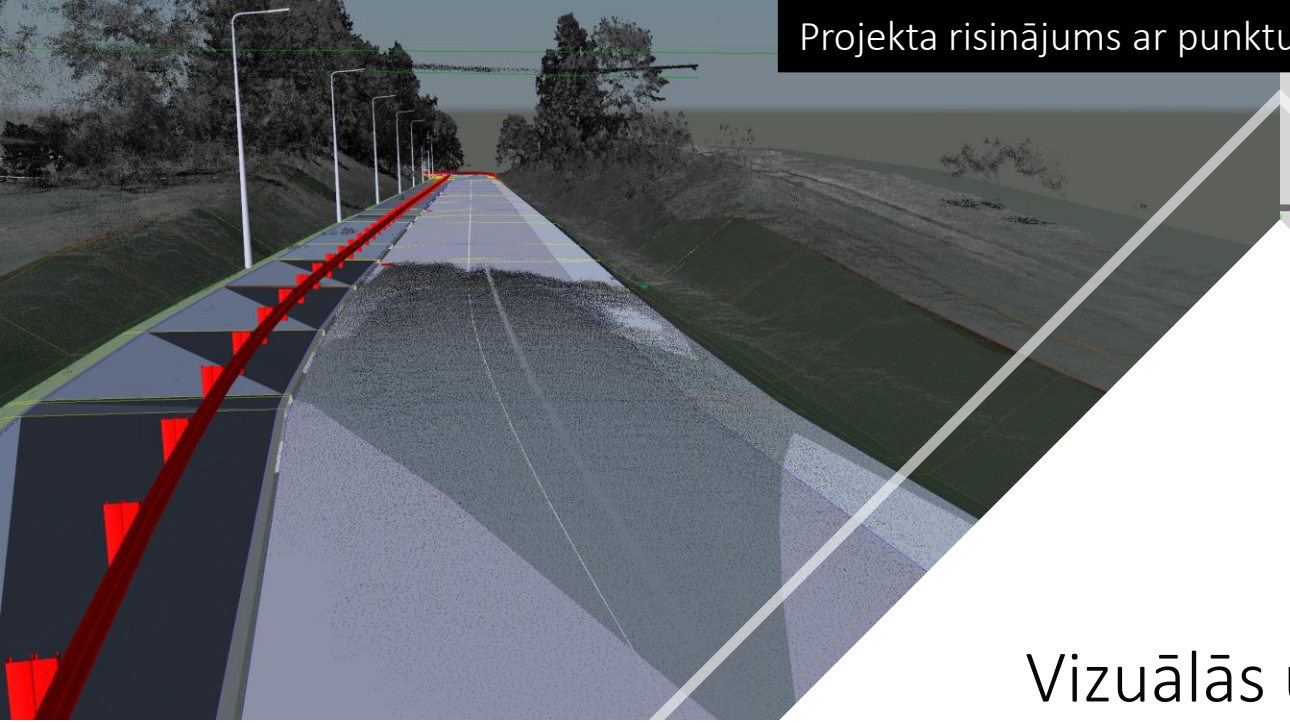
## Pareiza grāvja teknes un grāvja noapaļojuma uzmērīšana

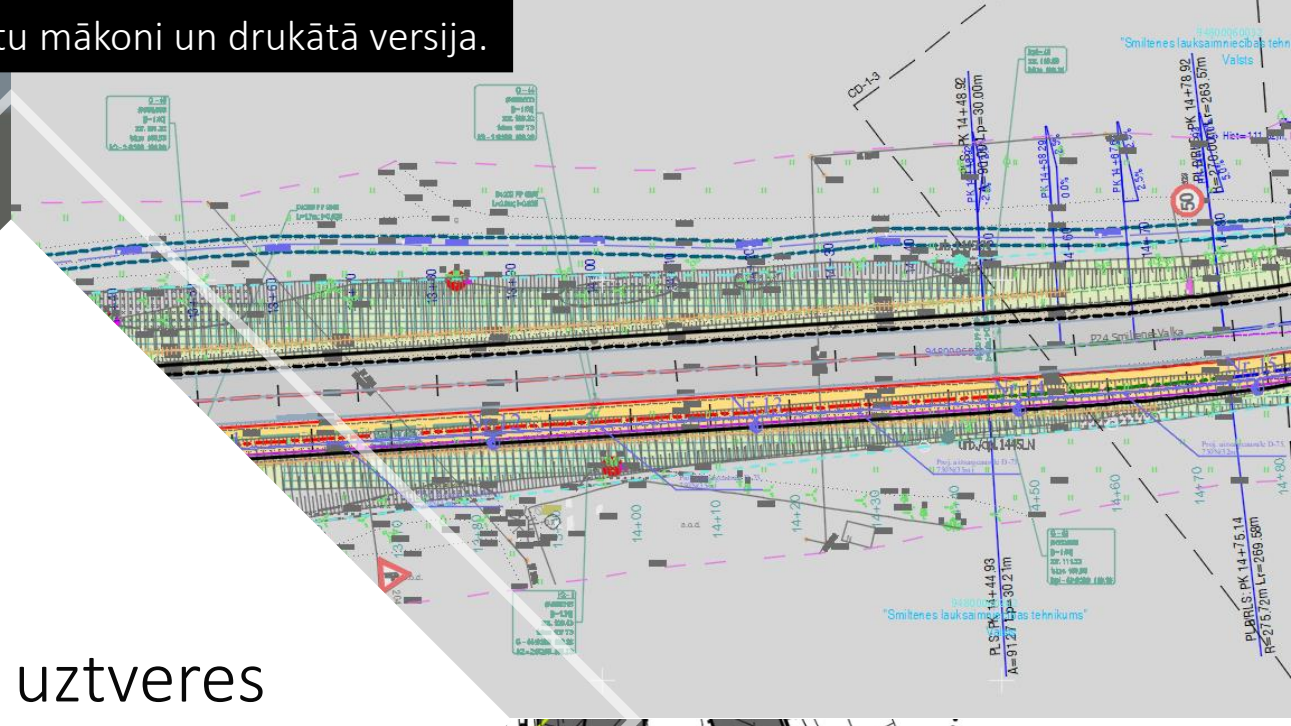


# Esošās komunikācijas BIM modelī un to klasificēšana

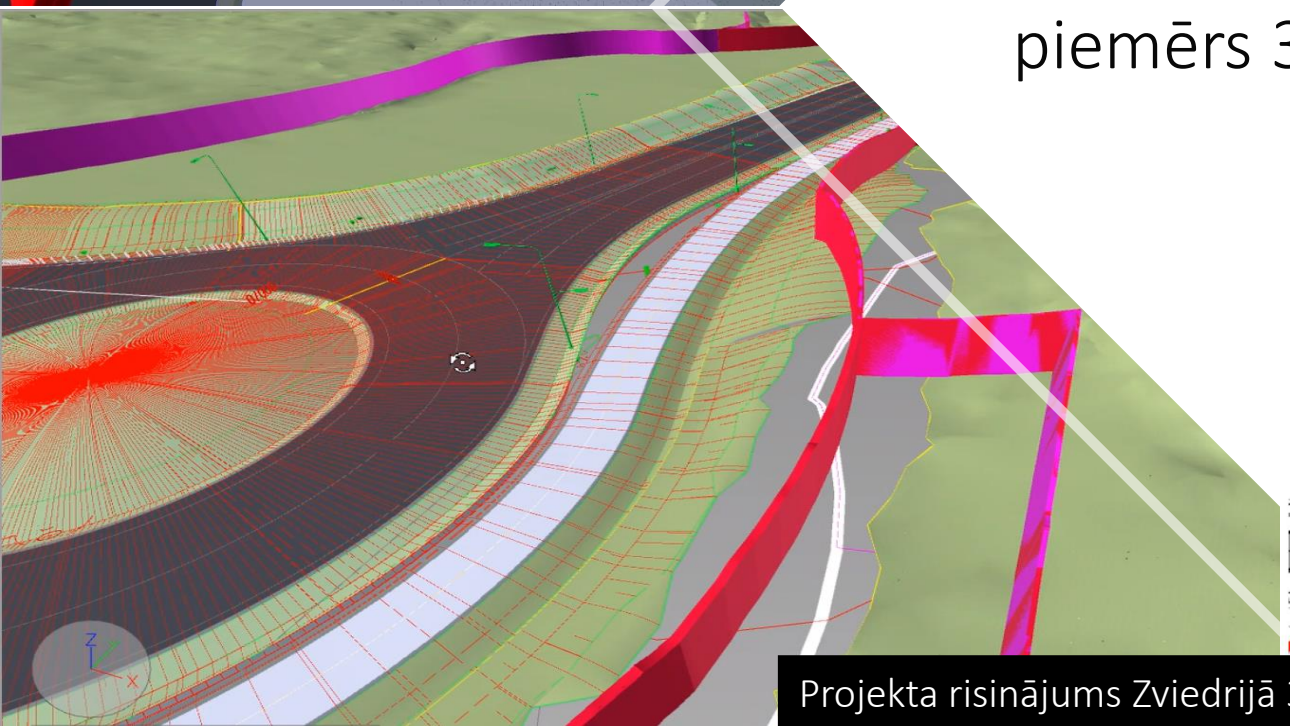


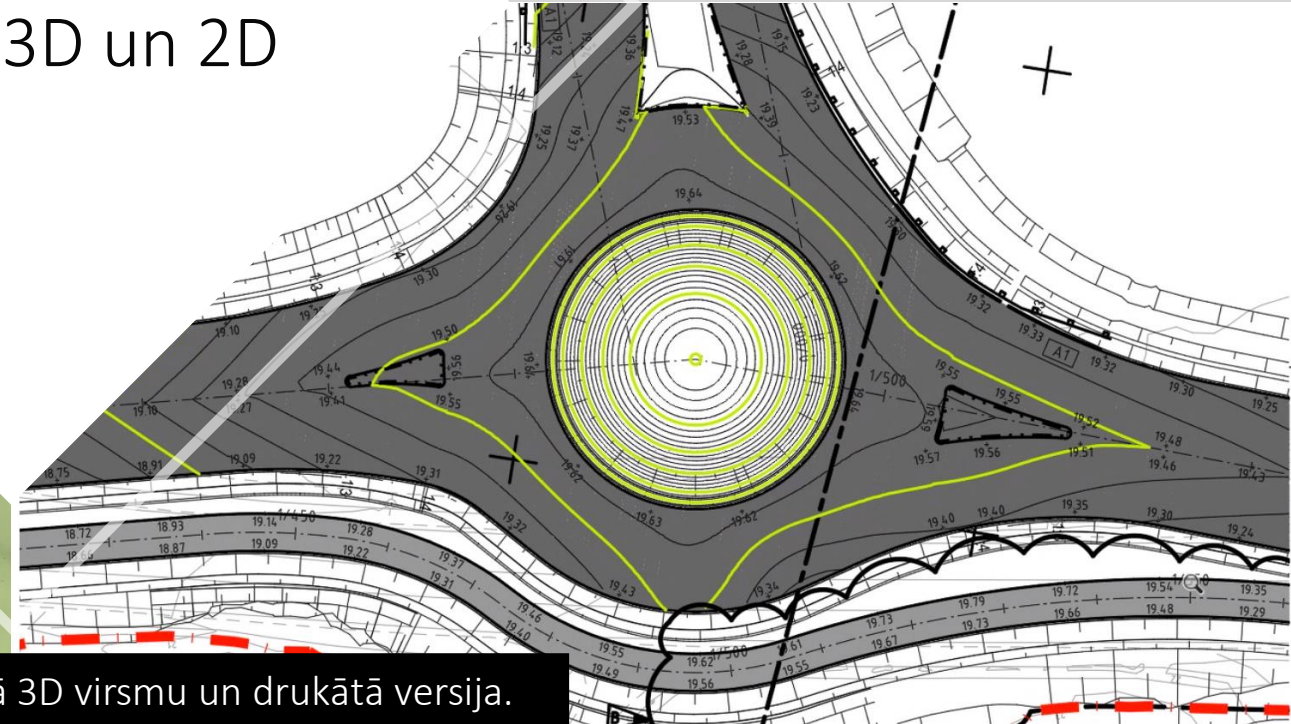
Projekta risinājums ar punktu mākoni un drukātā versija.





# Vizuālās uztveres piemērs 3D un 2D





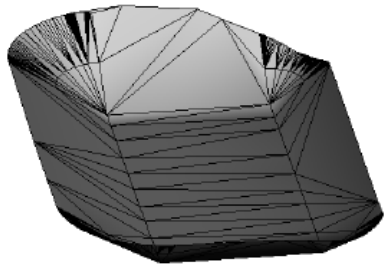
Projekta risinājums Zviedrijā 3D virsmu un drukātā versija.

# Discipline Model Specification

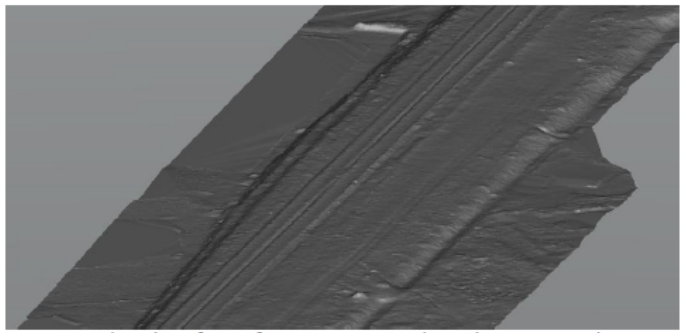
## LOD requirements for BIMinfra infrastructure models February 2020

BIM INFRA.DK

### Instrumentāli uzmērīts esošais reljefs

| LOD 100 | LOD 200 |
|---|---|
| LOG 100 | LOG 200 |
| Not relevant |  <br>Sublayers is modelled as 3D triangulated surfaces e.g. top and bottom of soft soil. |
| LOI 100 | LOI 200 |
| Pending | DDA Layers<br>Geometrical parameters. |

### Skenēts esošais reljefs

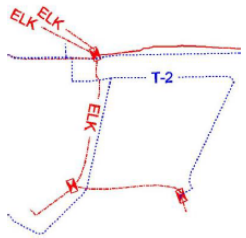
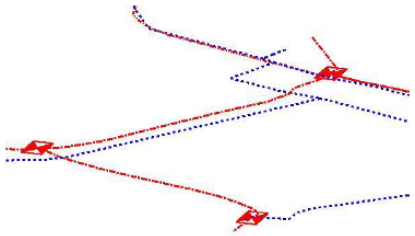
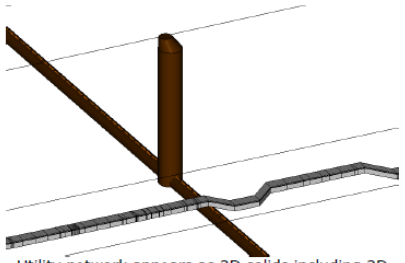
| LOD 100 | LOD 200 | LOD 300 |
|---|---|---|
| LOG 100 | LOG 200 | LOG 300 |
| Not relevant | Not relevant |  <br>3D triangulated surface of existing terrain based on survey data. |
| LOI 100 | LOI 200 | LOI 300 |
| Pending | DDA Layers<br>Geometrical parameters. | Pending |

# Discipline Model Specification

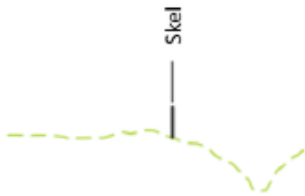
## LOD requirements for BIMinfra infrastructure models
## February 2020

BIM INFRA.DK

## Esošās komunikācijas

| LOD 100 | LOD 200 | LOD 300 |
|---|---|---|
| LOG 100 | LOG 200 | LOG 300 |
|  <br>2D model of utility network modelled as lines and points. Manholes and cabinets appear as 2D signatures. |  <br>Utility network appears as 3D reference lines. Manholes and cabinets is indicated by a point and appears as 3D signatures for top. |  <br>Utility network appears as 3D solids including 3D reference lines. Manholes and cabinets appear as 3D solids and points indicating the center. |
| LOI 100 | LOI 200 | LOI 300 |
| DDA Layers<br>Geometrical parameters<br>2D text indicating type of utility and utility owner. | DDA Layers<br>Geometrical parameters<br>2D text indicating type of utility and utility owner. | Pending |

## Īpašuma robežas

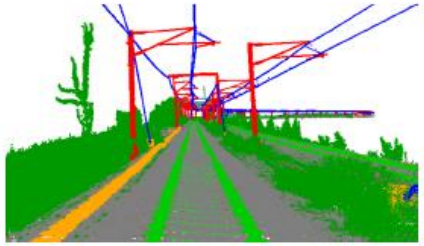
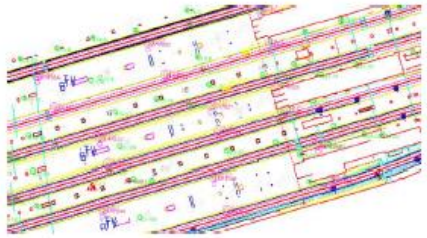
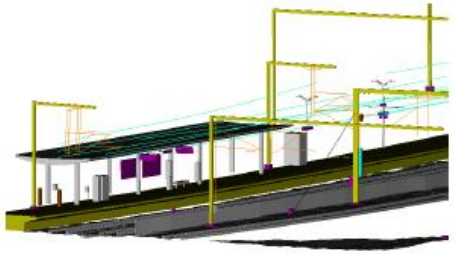
| LOD 100 | LOD 200 |
|---|---|
| LOG 100 | LOG 200 |
|  <br>Boundaries and areas are modelled in 2D as lines and polygons. |  <br>Areas are modelled in 3D and draped to terrain. Boundaries are modelled in 3D, so they are visible in section view. |
| LOI 100 | LOI 200 |
| DDA Layers<br>Geometrical parameters. | DDA Layers<br>Geometrical parameters. |

# Discipline Model Specification

## LOD requirements for BIMinfra infrastructure models February 2020

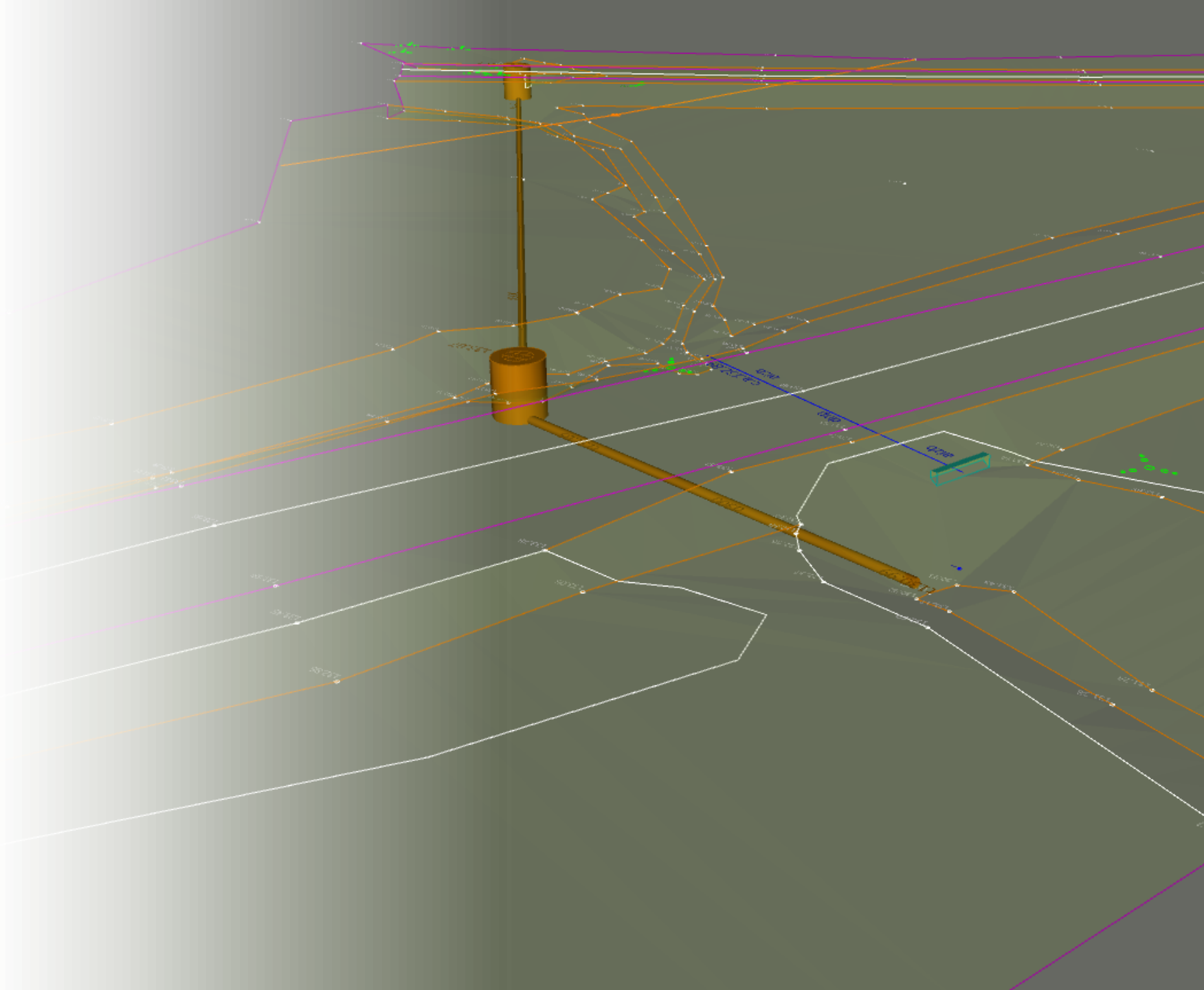
BIM INFRA.DK

### Uzmērījums

| LOD 100 | LOD 200 | LOD 300 |
|---|---|---|
| LOG 100 | LOG 200 | LOG 300 |
| Not relevant |  <br>  <br>Survey is represented by 3D data. 3D data is be represented as points, lines and polygon. Survey can also be a classified point cloud. |  <br>Survey is represented by 3D data. 3D data is represented as 3D objects e.g. triangulated surfaces, solids, meshs, lines etc. |
| LOI 100 | LOI 200 | LOI 300 |
| Pending | DDA Layers<br>Geometrical parameters. | Pending |

# Secinājumi:

- Planšetes izmantošana nav pieļaujama.
- Uzmērījumi būtu jāiedala detalizācijas līmenī (LOD 100, LOD 200, LOD 300) atkarībā no tās tālākās pielietošanas nepieciešamības.
- Informācija par esošajām komunikācijām būtu jāuztur komunikāciju turētājam, kas to izsniedz topogrāfam.

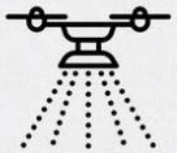


KVADRI FRONS

## Droņīt

/drɒnьi:t/
*trans. / 3. knjg. d. v.*

1. Vadīt bezpilota lidaparātu (*BPLA*), dēvētu arī par dronu (no angļu: *drone*) *(«Āris aizgāja padroņīt» «Es negribu droņīt, bet labprāt paskatītos, kā to dari tu»)*



**Avots:** «KVFRV»
KVADRIFRONA vārdnīca. Rīga, KVADRIFRONS, 2021

Dr

# Jautājumi?